NO. 14 CATALOGUE

H. S. TURNER
72 Montreal Street
GODERICH, ONTARIO

SAW MILL MACHINERY

WATEROUS ENGINE WORKS CO. (Ltd.)
BRANTFORD, CANADA

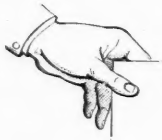
Bingham & Webber, Printers, Toronto

1890

ESTABLISHED

1890

ESTABLISHED
1844.



Saw Mills
Saw Mill Machinery

: : : : : : : : : IN this Catalogue we purpose giving such information of our Saw Mills and Saw Mill Machinery as will be interesting and useful to those who contemplate investing in such machinery.

: : : : : : : : : HAVING been established in business in Brantford since 1844, it is unnecessary we think, to do more than illustrate our machinery, describe the different machines and the improvements we are from time to time making. Our machinery is scattered all over Canada, from British Columbia to Newfoundland, and from Hudson's Bay to Southern Ontario, and in many foreign countries as well. It all speaks for us. Mills we built 35 to 50 years ago are running to-day, cutting their stock each year; and we are really proud to say that in every section where our machinery has been once introduced, more has invariably followed.

: : : : : : : : : *Our maxims have been that "Nothing can be too well made." "Make the machinery as it should be in every part and then set the price at a fair profit considering the cost." "Never cut the price and then cheapen the production to suit the price." "That mill men and people generally can and do appreciate a good article and will generally buy it, even if first taken in with some cheap machine said to answer as well."* **After forty years of successful business life** on the same premises, conducted on these lines, we have no reason to regret having started out with this standard before us. It has given us a reputation we are proud of, one that we cannot afford to injure; and one that has kept us in full operation during these years, when many shops have been closed and others run short handed or on short time.

: : : : : : : : : OUR EXPORT TRADE, which has been growing steadily for the last fifteen years, has assumed proportions that warrant our giving it the closest attentions, and our many foreign customers can rely on having their machinery properly made, properly packed and boxed, suitable extras provided free and machinery shipped to prevent delays in transit.

: : : : : : : : : IT HAS required much experience to suggest proper methods, etc., to overcome the many obstacles incident to a foreign trade.

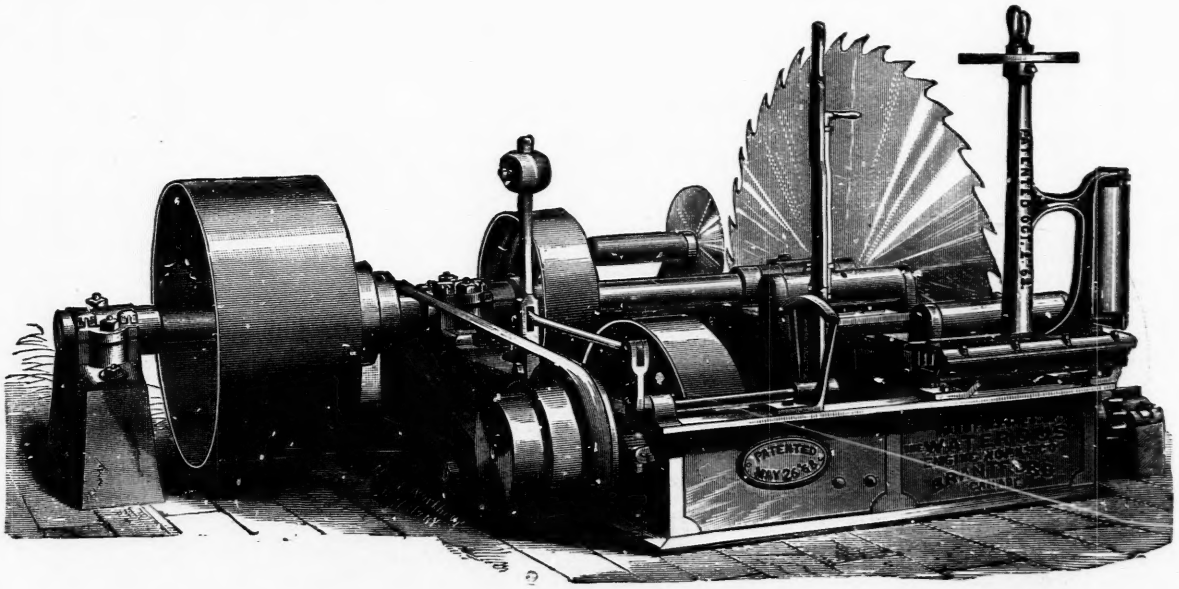
: : : : : : : : : AS IT IS impossible in a short circular of this kind to more than outline our various machines, we shall be much pleased to answer any and all enquires. When asking for descriptions, prices, etc., it is better to give all the particulars possible in regard to the nature of your wants and the material you want to manufacture. If a saw mill is wanted, the average and extreme diameter and length of logs, into what sizes, etc., they are to be manufactured; capacity of mill you wish per day; whether saving of timber is of more object than fast cutting; if brick or stone can be conveniently procured; if you contemplate in a short time increasing your plant by the addition of more machinery; position mill is to occupy, if it is already located, *i.e.*, if on level ground, at foot of gentle slope or incline, if on a sheet of water from which logs can be drawn; if a ground mill or an elevated mill is desired, etc., etc. The more information given us on these and other points of the work to be done, the better we are enabled to decide what will best answer your purpose and to send you estimates accordingly.

: : : : : : : : : WHEN asking estimates for machinery required in a hurry, or **when ordering,** it is well to send a rough sketch of location if any special one is desired, showing the size of building; on which side or end engine or boiler is to be placed; where logs are to enter, and where lumber is to go out. This enables us to determine which hand saw irons and engine you require, and when quoting prices also give date at which machinery could be shipped. It is well, too, if the position is immaterial, to say so, especially if in a hurry for the machinery, as we sometimes have one hand of mill or engine more advanced than the other. Small portable or semi-portable mills are most frequently made with left-hand engine and right-hand saw irons, and these are what we generally have in stock or in a more advanced shape.

: : : : : : : : : WE SOLICIT your enquiries and orders, which we need hardly say shall have our best attention.

Waterous Engine Works Co.

BRANTFORD, CANADA



NO. 2 SAW FRAME.

RIGHT hand. The reverse of this would be left hand. To distinguish right from left, stand in front of saw's edge, saw cutting towards you, on which hand does the log pass? If right hand of saw, it is a right hand saw and saw irons. If on left, the reverse.

This Frame is not cast solid, but is fitted and bolted together at the corners. This makes it specially convenient for export, when it is necessary to have packages in as small a compass as possible for interior transportation.

No. 1. Improved Rigid Saw Frame.

No. 1.—Saw Frame.

MADE from new patterns—medium size

No. 1.—Saw Frame.

No. 1 Improved Rigid Saw Frame - -

MADE from new patterns—medium size—takes the place as shown in cut of our original Style "A," frame being a much better frame, and with Waterous or Lane timber gauge and wider face frictions, of our original "E" frame, No. 2 when it is not desirable to have frame detachable, being equally as good in every particular, and in some points better.

CAST IN ONE PIECE, WELL RIBBED AND BRACED.

The Medium Size Frame is used for any size saw up to 60 inches. We make it with from 4½ inch face frictions to 8 inches.

Saw Mandrels are Heavy Steel, forged specially for us. They are made with the greatest of care—to special templets—so that at any time saws can be ordered by telegraph and a sure fit guaranteed. The mandrel is one of the most important parts of the mill, for if not properly made and fitted, the saw will not hang or run true, and uneven lumber is the result; either unsalable, or if sold, at largely reduced prices. See remarks on this point pages 3, 16 and 17 in **No. 12 Circular on Saws**. The mandrel boxes or bearings are adjustable either way so that saw can be readily lined in or out of the log and adjusted any way to overcome a tendency to run. See pages 8, 9 and 10 in circular 12.

Reservoir Oil Bearings, 3 in number, of good length filled with the finest white metal, are placed under mandrel.

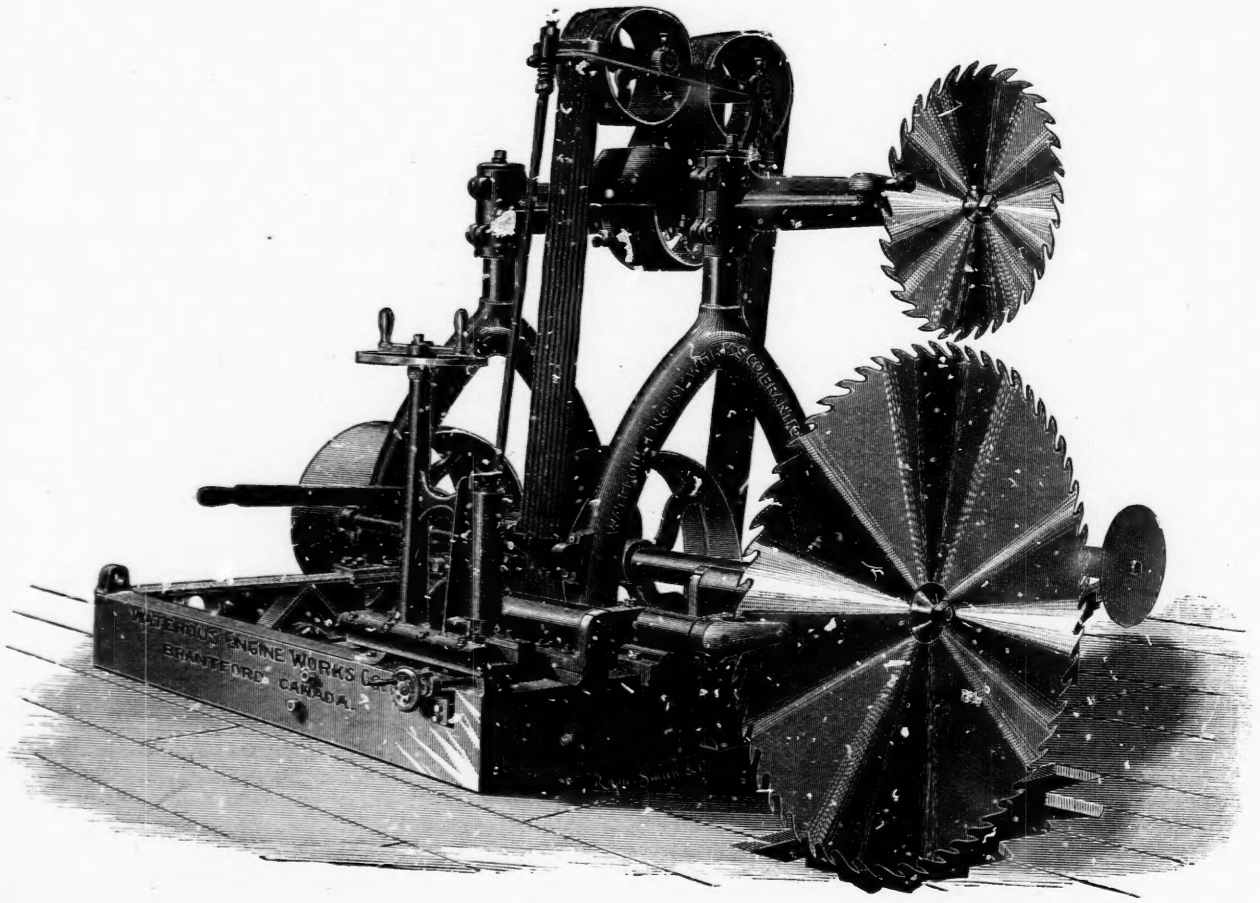
In this frame we have dispensed with timber Rollers to receive slabs, timber or boards, and in their place put the iron boiler plate fender as shown in cut.

Feed and Gig Lever shown in centre of front is easily operated to run the carriage backward or forward.

Receding Lever, when set works are arran[illegible]og, is placed near the sawyer's foot, being generally a small knob coming up through the floor. A slight pressure of the foot on thi[illegible] of a plank properly hung against a pulley attached to dog shaft by bevel gearing. Before, however, it can reach the pulley it acts on a trip lever which throws the set works out of gear. As the carriage returns, its motion causes the pulley to revolve by friction with the plank, and this runs the head blocks back as far as desired by sawyer, to receive the next log be it large or small.

Saw Guide, clearly shown in cut, is operated by a wrench applied to the heads of the two screws immediately under timber gauge, a slight turn guides saw as may be desired. Each half of guide being hinged and independent of the other. Any desired adjustment can be made, or the outer guide opened and thrown up to permit of saw being removed without disturbing the inner one.

No. 3—Heavy Saw Frame.



No. 3—Heavy Saw Frame.

Improved Heavy Saw Frame

THIS frame is made specially for heavy work, in connection with our new carriage for large logs that require a large saw. The mandrel is forged steel, very heavy, and runs in three long adjustable reservoir oil boxes. The frame takes in any size saw to 72 inches, and is amply strong and well braced, as will be seen from the glimpse shown of the inside, to stand the strain of so large a saw and the largest **Top Saw Frame as well.** The engraving shows the frame arranged with No. 3 or medium size top saw rig.

Saw Guide is arranged so that outer arm turns up and permits saw to be taken off without disarranging guide. This is an improvement **old sawyers** will appreciate, as they know the trouble sometimes experienced to get the guide adjusted properly.

It is also adjustable. The hand wheel shown in front of frame adjusts to a nicety the guide either way, so that while saw is running it can be controlled without stopping by the sawyer. This is **another improvement sawyers will appreciate.**

Timber Gauge is a special feature. The wheel or dial on top is brass faced, marked and drilled in ⅛-inches from ⅛ to 9 inches. To cut dimension stuff, it is only necessary for sawyer to drop a pin into the hole marked the size desired and turn handle to it; this brings the rollers the exact distance from the saw, so that when log is set up to it, the exact size wanted is cut.

New driving arrangement for upper saw, answers for an adjustable tightener by connection with the lever and stop attached in front of the top saw frame, and also reverses the motion running top saw against the log in place of with it as lower side of under saw runs. By running this saw in this way, the dirt, gravel or grit is thrown out of cut by saw in place of into it, as would be the case with reverse motion.

Top Saw Frame, clearly shown in cut is our No. 3 and 4; it is strong and well braced, making it very stiff. By means of the turned uprights it is adjustable by screws, to line with lower saw or to take up the wear in the saws.

It is furnished with self-oiling boxes and an adjustable saw guide.

No. 1 and 2 Top Saw Attachment consists of hangers, mandrel, girder, braces, saw, etc., to hang to beams of mill where frame will not permit of attachment to it.

Friction Feed and Gig Works.—These are well portioned in both saw frames, in medium from 4 to 8 inch face, and on heavy from 6 to 10 inch face according to work to be done. They are hung in adjustable bearings so as to enable all wear to be taken up. The small feed friction is made on a cast centre, well bolted completely through, and in addition is fitted to a square shaft which effectually prevents all turning and working loose.

Extra Heavy Saw Frame

No. 4—CAST Solid, ribbed and braced in the most substantial manner to stand the heaviest possible work that a circular saw can be put to, also to carry a top saw attachment of the heaviest type. The holding down lugs have elongated bolt holes to permit of easy adjustment of frame on its foundation. **The Mandrel** is of forged steel, 5 inches in diameter, and runs in long hollow air space boxes, lined with the finest babbit. It has an inch hole bored through it to permit of cooling or lubricating liquid being forced on the saw. Pulley or Mandrel, 36 x 21 inches on solid disk, and turned all over.

The Frame strengthened by two cross braces on which rest the uprights of the top saw attachment.

The Saw Guide is the hollow independent style, made so outer leg turns up for removal of saw.

Top Saw Attachment is supported on arched brackets, giving the greatest strength. They are also well ribbed. The upper mandrel is 4½ inches in diameter, of forged steel, and has 1 30-inch pulley, 17-inch face, webbed and turned all over.

The Upper Mandrel is adjusted to and from the lower saw by means of a screw at either end, worked by worm gearing on a connecting shaft—all worked by a hand wheel, insuring the adjustment of mandrel parallel.

The tightener frame and pulleys, 18 x 17-inch face, are adjustable with a lever for tightening belt.

This frame will admit a 72-inch lower and 72 inch upper saw. It has no carriage feed attachment, it being designed for use with a steam feed or separate power feed. Space occupied, 9 ft. 2 in. x 9 ft.. Weight, about 7 tons.

The Champion Gang Edger - -

MILLS and logs that require our **No. 4 Saw Frame** need a specially designed saw carriage as our No. 6, and an extra heavy gang edger that will take on a cant 50 to 60 inches wide, 3 to 8 or 9 inches thick, and rip it into dimension lumber. This want our Champion Edger is designed to fill. For strength, durability and simplicity it cannot be surpassed. Its cast frame specially heavy, is 11 feet x 5 feet, and 7 feet high, all strongly ribbed and braced.

The Mandrel is 4 inch steel running in 3 boxes 12 inches long, chambered for the circulation of water when necessary.

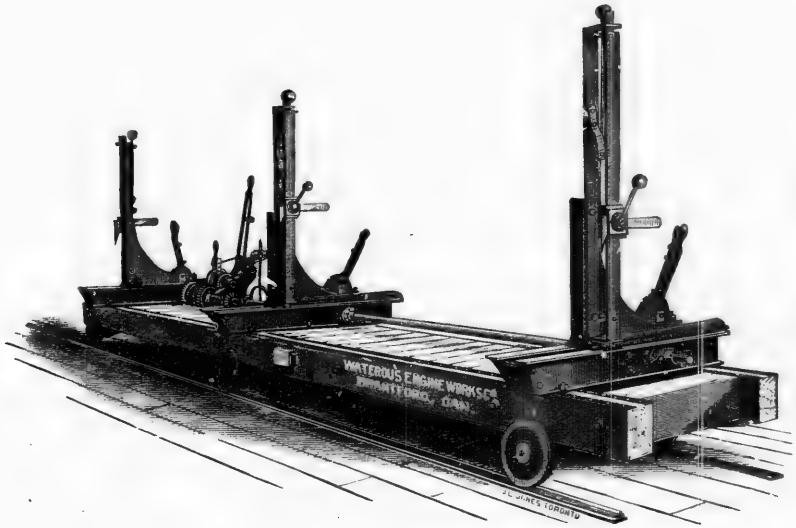
Driving Pulley is 18 in. diam. x 25 in. face, webbed and turned all over.

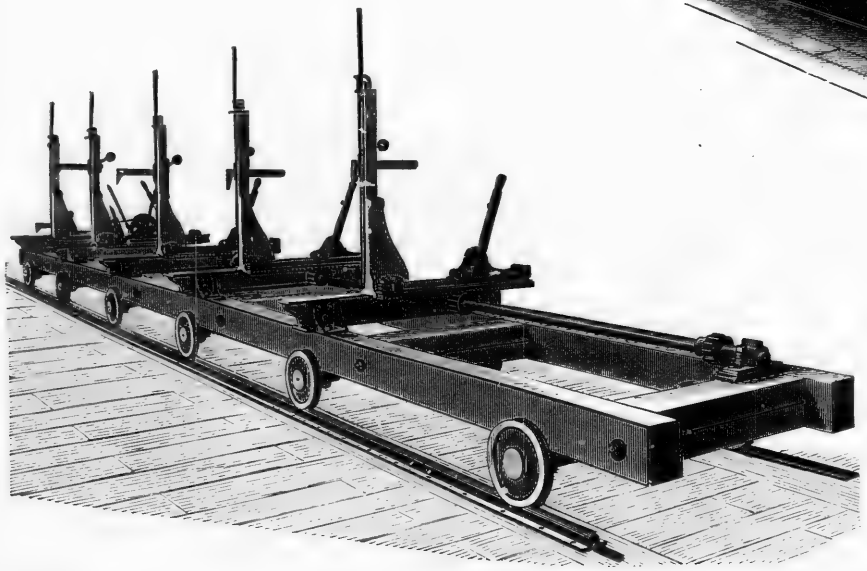
The Feed Rollers are solid iron fluted, cast on steel shafts. The top or press rolls are plain and geared to speed of feed rolls and are all driven. They are lifted by power to the size of timber to be sawn. The capacity in width is almost unlimited and the machine will handle cants with ease, 8 inches thick. The 50 inch edger is 51 inches clear between guide rolls.

The Saws are 24 to 26 in. diameter, held in steel collars and moved on the mandrel by steel arms working on the collars. The saws are held in the cut by brass safety guide, having adjustable "lignum vitæ" steady pins on each side of saw. To each saw there is a special handle by means of which the operator can instantly adjust them to the desired width of the cut, from 3 inches wide up. The outer bearing of mandrel consists of a movable bridge-tree quickly removed for the slipping off dull and replacing with sharp saws.

The Feed is an independent variable disc by which the operator can instantly vary it to suit the nature and size of material being cut. Great care has been taken to make this Edger strong, simple, easily handled and kept in repair. It is specially adapted to the wants of lumbermen on the Pacific coast. Its weight is 11 to 12,000 lbs.

Steel Girder
"SAW CARRIAGE."





The Engraving above Illustrates our "No. 3 Carriage," with Geared Friction Set Works. The lower one, our No. 1 Carriage with Double Action Friction Set Works.

The New Steel Girder Log Seats

ARE a complete change from the cast iron log seats that we have been building for many years past. We found it necessary to increase the weight of these cast iron log seats to secure strength to stand with safety the weight of large logs. This excessive weight had to be run back and forward continuously, taking extra power and causing extra friction and wear. With the Steel Girder we gain excessive strength with great lightness, or, in other words, a light, unbreakable block. The change in style of log seat necessitated a change in style of carriage, as will be seen by cuts on opposite page. The carriage is supported on wheels with heavy axles, connecting front and rear wheels and running in large reservoir oil bearings. Front wheels are V. and back wheels flanged.

Frame work is of Norway Pine, well framed and firmly bolted together, the whole forming an exceptionally strong and rigid carriage. When desired, long carriages can be divided into as many sections as required, so that all the carriage need not be operated at once.

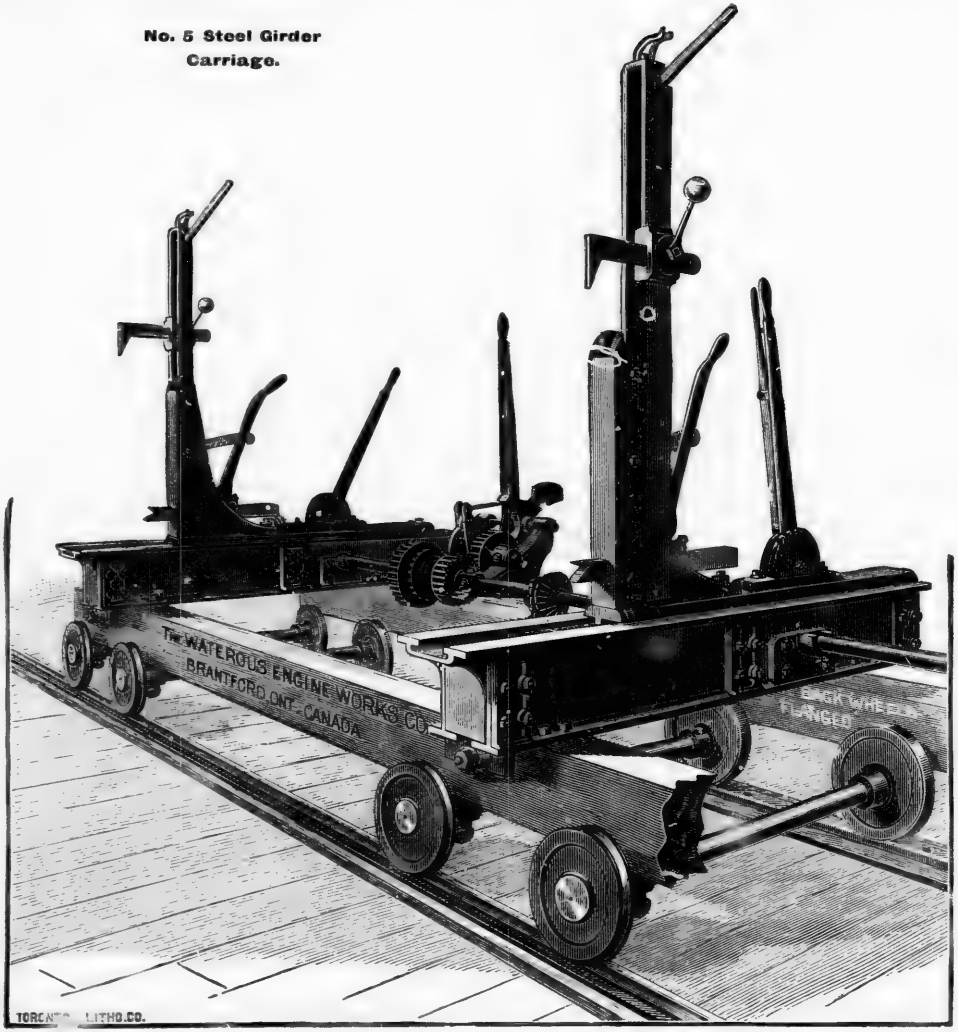
Cable feed further reduces the weight. We actuate these carriages with steel cable, as shown on Page 26, or hemp rope if preferred.

Our "Peel" Dog fully shown in cuts of carriages, is another feature added to and used on all our carriages. It is very strong, quick working and reliable. With it a round log can be instantly dogged firmly, although frozen hard, and in a second the log can be undogged and the dog put in position to hold last board while it is being sawn 1 inch or ¾ thick. After log is squared on two or more sides, the lower dog comes into play and it holds top and bottom as if in a vice. **Its use increases the capacity of a Mill fully 10 to 20 per cent.**

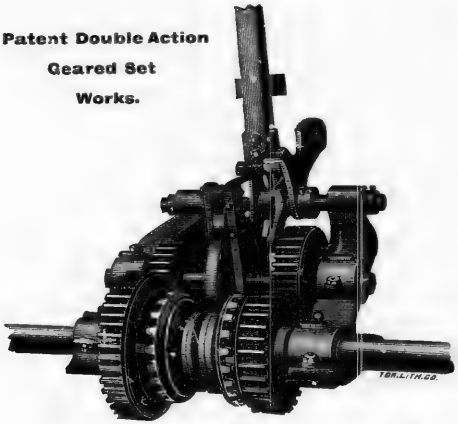
Other styles of dogs are applied to carriage when desired.

Self-Receding Attachment is now placed on all our Carriages, and is arranged to work from in front, or by setter riding on carriage.

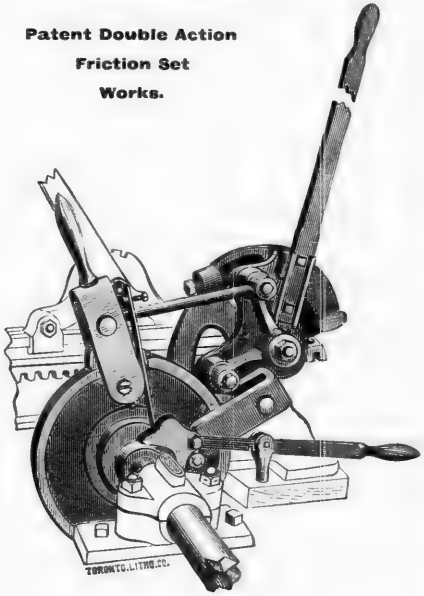
No. 5 Steel Girder Carriage.



Patent Double Action Geared Set Works.



Patent Double Action Friction Set Works.



The Carriage

ILLUSTRATED on the opposite page represents our No. 5 Steel Girder Carriage, each block consisting of double heavy 10 in. girders with double axles and double wheels under each

Patent Double Action Geared Set

No. 5 Steel Girder Carriage.

The Carriage

ILLUSTRATED on the opposite page represents our No. 5 Steel Girder Carriage, each block consisting of double heavy 10 in. girders with double axles and double wheels under each block. The engraving illustrates the iron work accurately, but not the wood work, it having been engraved from a photograph taken from a carriage temporarily erected in our works. These log seats open up 60 inches from the saw, and can be made to open much further if desired.

The dogging device is our Peel Dog, without the lower or under dog, and a lower dog from the centre of the upright, to be run out to hold steadily the bottom of the log. This lower dog is worked by a handle, as shown.

Each knee is receded independently of the other by the handle in the middle of the slide. One knee is shown in the ordinary position and one drawn back as far as it will go. The logs are set forward by rack and pinion.

The front wheels are very heavy and made to run on a V track. The back wheels are also heavy and are made with a flange to assist in keeping the carriage on the track.

The axles are 2½ in. steel for the ordinary length of log seats, and larger where the length is increased.

Double Action Geared Set Works.—These set works are arranged with a foot lever attached to an iron spool on the dog shaft working between the two geared wheels shown in front of the set works. With this lever the spool toothed at each end is moved to the left to engage in the smaller spur wheel for fast set, or to the right to engage in the larger spur wheel for slow set, increasing very materially in this latter instance the setter's power over the heavy logs. The set works are operated by double clamps working on the friction wheel and so arranged that every motion of the lever, either forward or backward, moves the log forward. This makes the set works quite fast on the fast feed and moderately slow on the slow feed.

It will be noticed that the teeth of the gear wheels are supported by a flange, making them extra strong, and reducing the liability of breaking. This set is designed for setter to ride on carriage.

Double Action Friction Set Works.—The illustration shows the working parts of these set works so plainly that a further explanation is hardly necessary. As in the geared set works, each movement of the handle backwards or forwards sets the log forward.

The small handle at the lower part of the set works is moved forward or back to release the grips as the receding rig is brought into play.

These friction set works are very much superior to the old fashioned ratchet set works, which even with steel faced wheels will wear and become unreliable. With the friction set works there is practically no wear on the wheels or blocks and they will hold for years without liability to derangement.

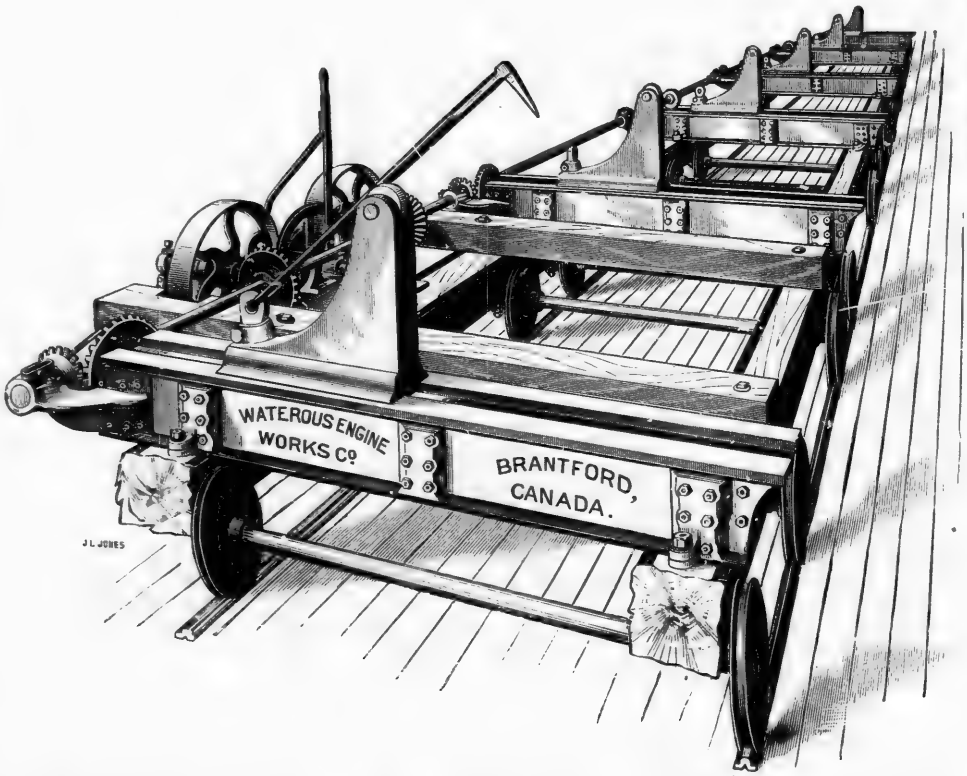
The Single Action Friction Set Works are generally arranged to set over the log.

The advantage we claim for this, is the position given the sawyer. He stands in front of the log, sees the last board as it drops, and at a glance can tell, as the log is returning, into what thickness of board it is best to put the next cut. If clear, a two or three inch plank is much more valuable than one inch, etc., etc. The instant the log returns, he grasps the set lever and sets for the next board while log is stopping and returning to the saw. With an expert sawyer the log never stops, and 7 boards, 14 inches wide, 1 inch thick, 16 feet long, have been easily dropped in one minute with our Portable Mills.

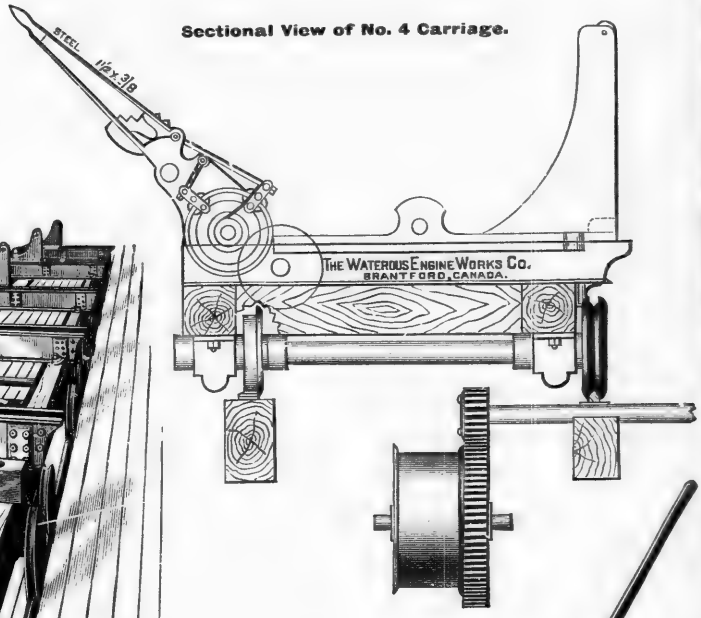
These Set Works are also arranged so that one pull of the set lever, as far as it will go, sets for ½ inch, 1 or 1½ or 2 inches, as case may be. That is, it can be set for any of these thicknesses, so that if set for 1 inch, one pull is 1 inch, two pulls make 2 inches, or if set only ½ inch, 3 pulls will make 1½ inches.

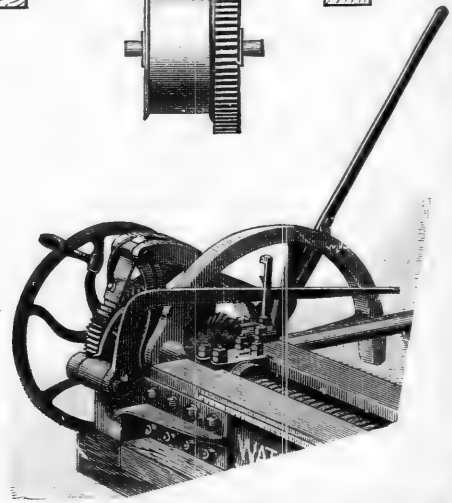
THE Illustration on opposite page shows

No. 6. Steel Girder Carriage, with Screw set.



Sectional View of No. 4 Carriage.





Double Action Ratchet Set Works, for Screw Set.

Sectional View of No. 4 Carriage.

No. 5 and 6 Steel Girder Carriage

THE Illustration on opposite page shows the detail so distinctly that a description is hardly necessary.

The upright is heavy and strong, with an independent adjustment in No. 5 to each knee for taper stuff or crooked logs. It has roller on top flush with face of knee to facilitate turning of large logs. It works on two steel girder bars clamped together, making one block, each faced with steel and then planed true. These blocks have a wide bearing on timber, and are bolted to it. The central castings, back and front, extend below edge of timber, and can be wedged to it as well as bolted. The timbers are Norway pine, well framed, and bolted together, and top edges protected with flat bar iron, The axles are steel, with heavy self-oiling boxes, collars, and V front wheel and flanged back wheel.

The axles vary in size to suit the work, from 2¼ to 3 inches.

The track is a steel V front track, and flat bar iron back track. The set shaft is steel, 2⅛ to 3 in. diameter, coupled in suitable lengths, and furnished with single action friction set works for small carriages to double action friction and geared set works (See page 25). With this latter set the setter rides on carriage, and each movement forward and back advances the knee. The platform he stands on extends out from back of carriage. A small gauge is attached to set handle, which is readily adjusted and set for any thickness against the notched segment at back of handle. In the Geared Set a lever beside the set changes it instantly from fast to slow by moving the centre double gear, or disengages it entirely to enable the receding rig to act. With these set works the receder is worked by setter, a handle being convenient for the purpose.

This carriage is made in the following sizes :

No. 1—Single Light Girder. **Single Axle and Wheels under each Block.**

No. 2—Single Light Girder. **Double Axle and Wheels under each Block.**

No. 3—Double Light Girder. **Single Axle and Wheels under each Block.**

No. 4—Double Light Girder. **Double Axle and Wheels under each Block.**

No. 5—Double Heavy 10-in. Girder. **Double Axle and Wheels under each Block.**

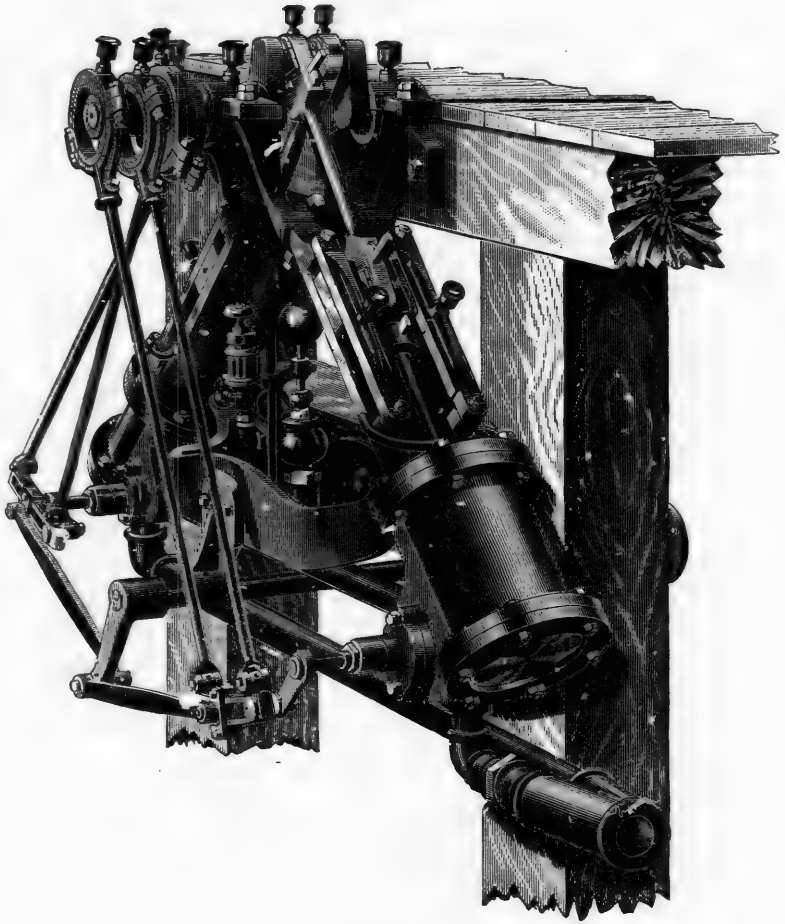
(All above have Segment and Pinion Set.)

No. 6--The same as No. 5, but shorter and heavier Knee, and Screw Set, for very large logs.

The largest illustration on page 26 shows our **Pacific Coast Steel Girder Carriage with Screw Set.** It was engraved from a photograph taken of the carriage furnished the Brunnett Saw Mill Co., New Westminster, B. C., in 1890, it having been erected at our works temporarily before shipment, the wood work is therefore not quite so complete as it would be when erected in a mill. This carriage was 70 feet from centre of first to centre of last block. The knees receding 66 inches from the saw, are worked by powerful 3 in. steel screws working in heavy phosphor bronze nut, and may be worked with power set works or double action ratchet or friction set.

This carriage, as shown without wood work, but including 174 feet of V and flat track, weighing 12 lbs. to a foot, weighed 24,000 lbs.

TWIN ENGINE STEAM FEED
Geared.



Twin Engine Steam Feed

IN all the larger mills in the lumbering centres the **"Gun Shot"** Steam Feed as it is frequently called is being replaced with the Twin Engine Feed like those shown on the opposite page, geared to the rope drum, or by oscillating engines working direct on the drum. The geared engines are **cheaper** in first cost, and more economical in steam. The engines being only 10 to 12 h. p. take very much less steam than the long cylinder (it having to be full length of carriage) which it is necessary to fill for each movement of the carriage, requiring in some instances one or more extra boilers.

Being in Engine Room, it is under the supervision and control of engineer as well as the control of the sawyer.

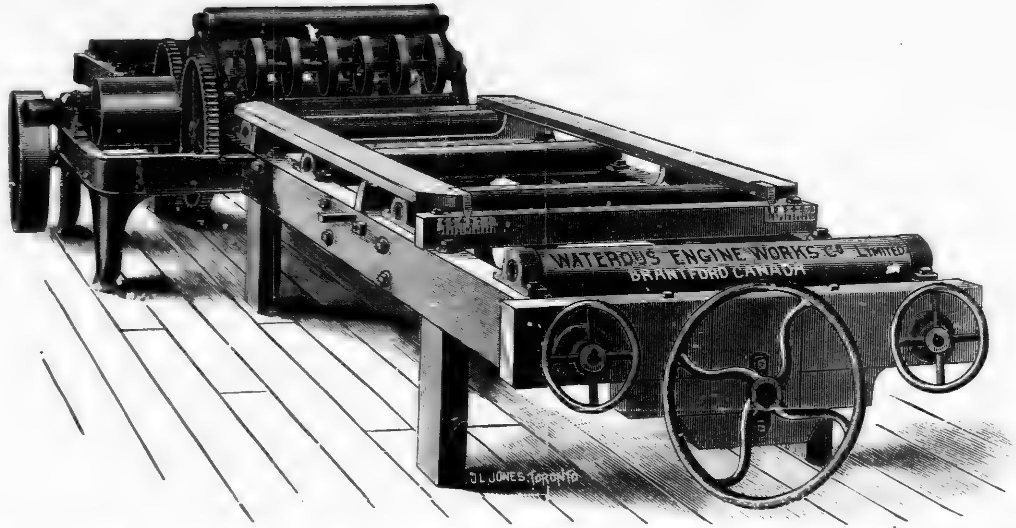
The engine shaft runs level with the floor, and on its other end are the pinions working in the racks of carriage or the barrel for **Rope Feed.**

The valve shaft runs to a convenient position and terminates in a lever so arranged that when operated it is instantly brought back plumb on the centre no matter where it is when sawyer releases it, and thus steam is shut off and the carriage stopped. The ball valve is worked by a cam attached to shaft, hidden in cut behind the brace, which raises the valve admitting steam no matter which way shaft is turned, but only lets in steam in proportion to the amount shaft is turned by sawyer's lever.

We also build two sizes of oscillating steam feed engines, connecting direct to rope barrels. Sizes are 8 x 12 cylinders, with 24 to 30-inch rope drum, and 14 x 20 cylinders with 30 to 36-inch rope drum. These engines are substantially built on heavy frames, and are exceedingly simple. Unlike most other types they oscillate on trunnions placed at the centre of the cylinder, which we claim is a great improvement. Being connected direct to the shaft of drum they are necessarily placed under carriage, and operated entirely by the sawyer.

The advantages of steam feed over friction or power feeds is its great and instantaneous range of speed. The carriage can be slowed up till it barely moves along, and next moment speed can be increased till it fairly seems to fly. The variations being under control of sawyer can be exercised at will without stopping carriage or mill to change. In the cone feed you have two or at the most three feeds; these are changed by moving belt on the cone pulleys so that feed is not often changed

Speed of Cutting is therefore much increased, providing there is plenty of power behind to drive the mill in unison with the carriage.



Improved Gear Feed Three Saw Gang Edger

THIS new Gang Edger has very valuable improvements to commend it. **The Frame** is one solid casting, very heavy, with a heavy cross piece, all well braced to make it as rigid as possible. The feet are fitted and bolted to the frame.

The Feed Rollers are connected to power by heavy spur gearing, strong and positive. They are 10 in. in diameter, fluted lengthwise, turned true; they are placed in front and rear of saws, making a positive feed to the lumber without marking it, and their size enables all kinds of rough and icy lumber to be easily passed through. They will also take through thick, round slabs, which can thus be edged and then passed through a re-sawing machine, getting often one to three inch boards out of them which would otherwise be wasted in slabs. The upper pressure rollers are 10 in. diameter, 1½ in. to 2 in. face, sufficiently far apart that saws can be readily seen and still catch all widths of lumber.

The Saws are 18 in. 9 gauge solid saws, fitted to a loose cast iron collar 6 in. diameter, 4 in. wide, provided with brass nut 1 in. wide, which holds saw firmly, but is easily removed as it does not RUST; also two set screws to hold outer saws in place where set. These collars work on a feather key fitted in mandrel. In the three saw machine the centre saw only is moved by large hand wheel shown in front of table; a pinion being placed on the inner end of the shaft engaging a rack cast into a sliding arm, which carries a saw guide which shifts the saw and at the same time steadies it. This guide turns up to permit saws to be taken off the mandrel.

A Movable Bridgetree is placed on the opposite end of mandrel from the driving-pulley; it is fastened with spring keys, so that it can be removed quickly and the saws quickly withdrawn for sharpening, or replacing with a sharp set of saws.

The two outer saws are generally placed with collar against the mandrel boxes; the inner saw being movable to any position to within 2½ in. to 4 in. of either saw.

The Movable Gauges on either side come flush with outer saws, so that with a square edge board the outer saw can be cleared, and with movable saw any width desired taken off, or gauge can be moved back any distance up to 6 in. By moving all the saws to one side three scantlings can be cut with three saws and gauge, from a square edge plank any width up to 6 in. and any thickness to 5½ in. The machine will edge any thickness to 5½ in. with 18 in. saws or 6½ in. with 20 in. saws.

The Gauges on either side are movable with hand wheels or with lever and quadrant.

When desired two saws can be made movable with hand wheels, dispensing with one of the gauges.

The machine can be made either right or left hand, the cut illustrating a left hand machine.

Dimensions of Machine—Speed of mandrel, 1,500 revolutions per minute.

Speed of feed, ¾ of an inch to each revolution of saws, or faster if desired when all thin lumber is to be edged.

Size of pulley, 12 in. diameter, 16 in face; floor space, including tables, about 29 ft. long and as wide as mandrel is long.

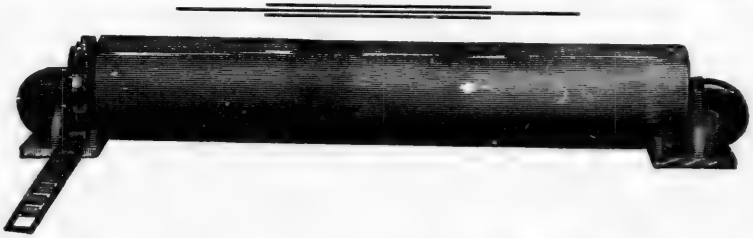
No. 1 machine with three saws, extreme length of mandrel 6 ft. 8 in.

No. 2 machine with four saws, extreme length of mandrel 7 ft. 2 in.

No. 3 machine with six saws, extreme length of mandrel 8 ft. 3 in.

No. 2 machine is the same as No. 3, but has four saws two to move and has a narrower frame. It also has divided pressure rolls.

No. 3 machine, largest size, is the same as No. 1, but wider and heavier, having 6 saws for two men to edge at one time. The pressure rolls are in this case divided so as to permit of different thicknesses to be put through, one on either side, at the same time.



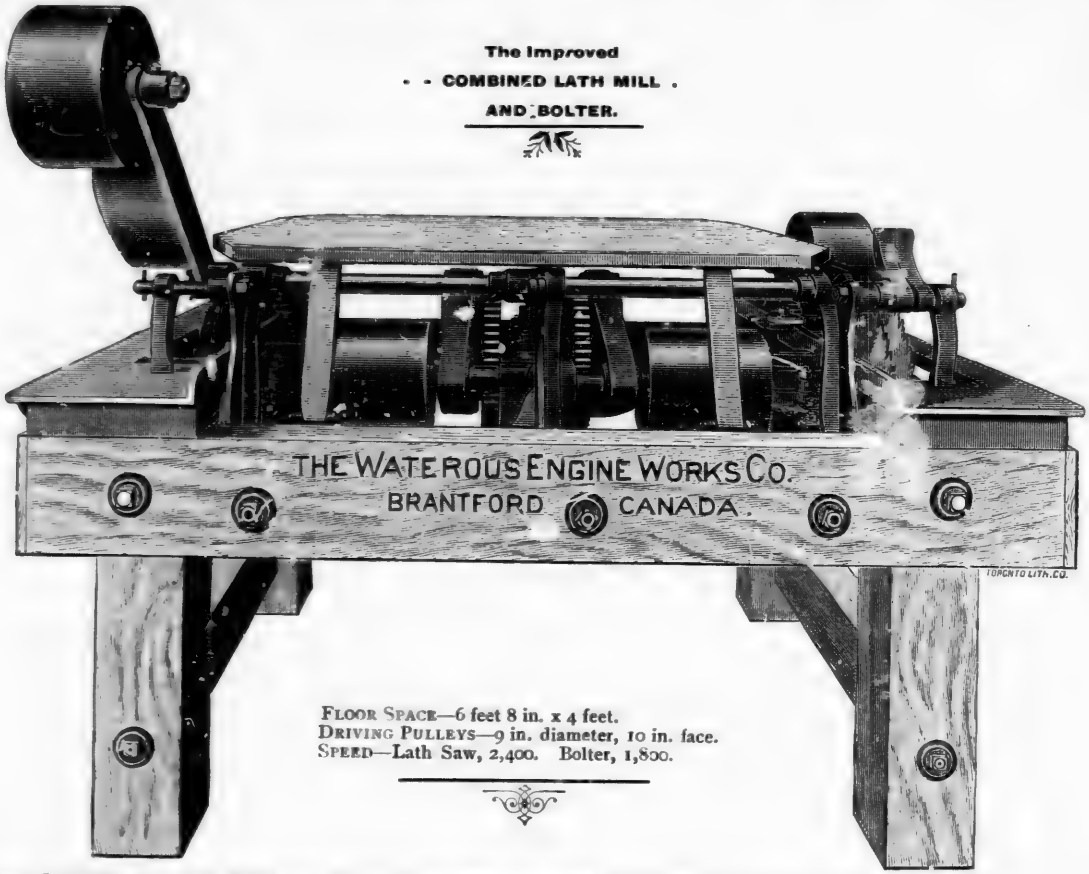
Live Roll for Timber, Lumber, &c.

- - - ALSO FEED ROLL FOR GANG MILLS. - - -

THIS Roll is made of cast iron with internal chilled bearings. The bracket bearings are also chilled and provided with a flange which acts as a keeper for the chain, holding it in position on the wheel. The wheel is cast on to the roller and being the same diameter does not deduct from working length of roll. This roll is about as cheap as a wooden one in first cost, and will outwear a dozen wooden rolls.

Made in all sizes. Send for prices, giving specification of what your require.

The Improved
- - COMBINED LATH MILL . AND BOLTER.

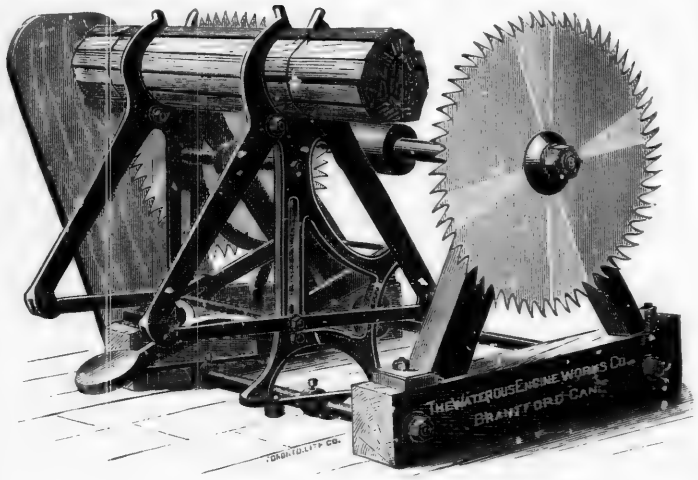


FLOOR SPACE—6 feet 8 in. x 4 feet.
DRIVING PULLEYS—9 in. diameter, 10 in. face.
SPEED—Lath Saw, 2,400. Bolter, 1,800.

This new Self-Feed Lath Mill and Bolter has been designed to meet the want of a simple, inexpensive machine that would bring these two operations as near together as possible.

The illustration is so good that further description to a saw mill man is almost needless.

Each mandrel is independent, and is driven by its own belt. The feed of each machine is driven from its own mandrel by belt to counter shaft, and geared from counter to feed shaft. The feed corrugated roller appears just above the planed iron table on each side, and material is brought in contact with it by the weighted roll. Feed is instantly stopped by raising this roller, as shown in cut. The safety fingers suspended behind each set of saws obviates all danger of pieces being thrown back by the saws. The table over mandrels protects the working parts and receives the lath bolts. It is hinged for ready access to the parts beneath.



THE IMPROVED COMBINATION

Lath Binder and Trimmer

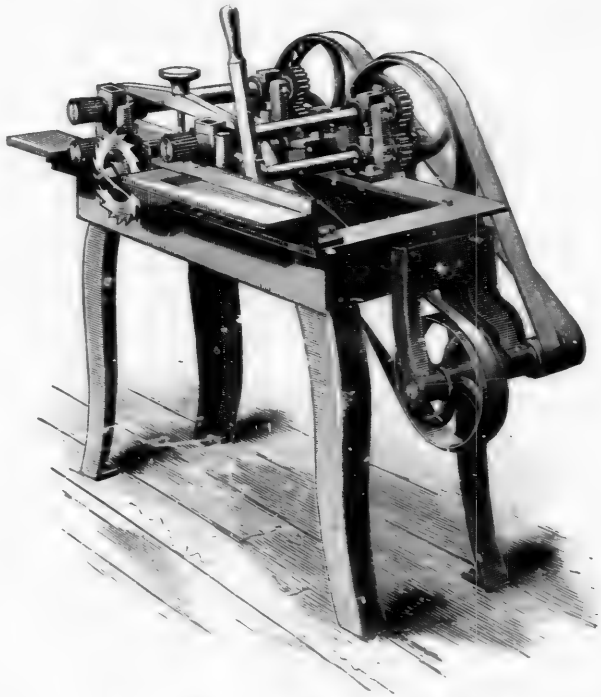
The above cut represents our Improved Combination Lath Binder and Trimmer.

TO BUNCH AND BIND:

When foot lever is raised the arms are extended and when the required number of lath are placed in drum with the ends against the guide on left hand side, pressure of the foot and lever instantly brings arms into position shown in the cut, binding lath closely and firmly. They are then tied.

TO TRIM BUNCH:

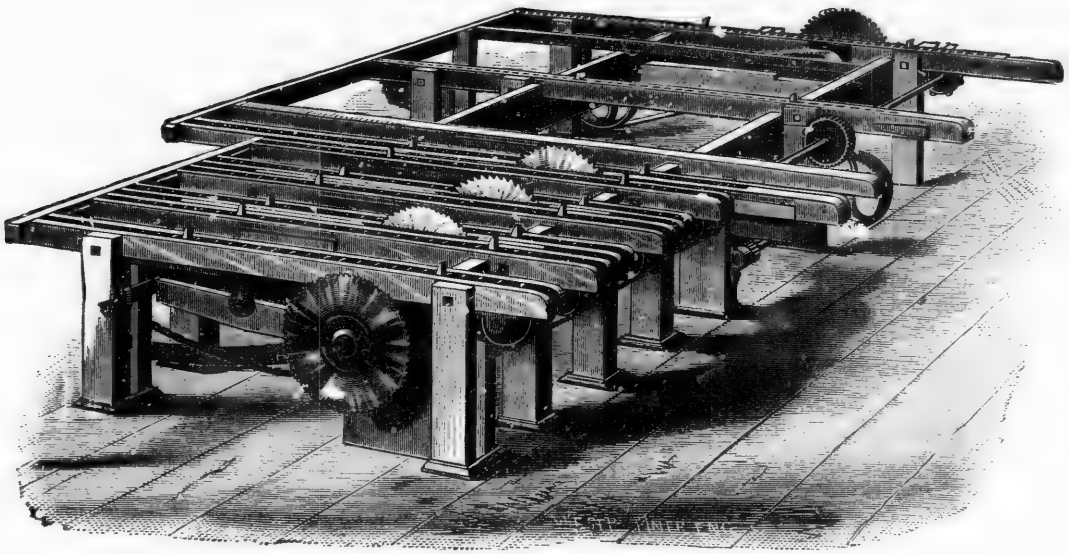
The operator simply tilts the packing frame over from him, causing the bundle to pass between the saws, thereby trimming both ends at one movement. The Lath being firmly held in the jaws of the Binder, permits the saws to make a smooth cut, which gives a nice appearance to the ends of the bundle. The bundle does not have to be removed from the Binder until after it is trimmed, thereby saving time and doing all in a workmanlike manner.



Gang Lath Mill

This machine has three saws. The lumber is run through by four feed rolls—two in front and two back of the saws; all of which are geared. This machine can be adapted to sawing slats for fruit racks up to three inches wide. It is made entirely of iron and steel, is strong and substantial in all its parts, and is guaranteed to be equally as good machine as any in the market at the same price.

Price includes Feed Belts as shown in cut.

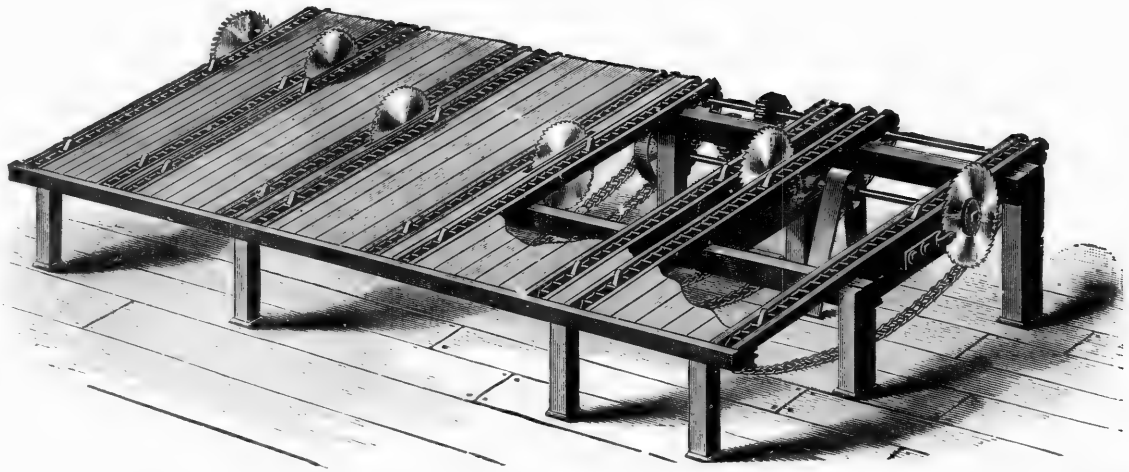


The Bay City Lumber Trimmer ❀ ❀ ❀

Gang Trimmer.—Capacity 100,000 to 150,000 feet per day: several hundred of these trimmers now in successful operation. The saws are hung on independent frames (a separate saw for each length cut), and are thrown up into action by foot levers, which at same time drop the saw last used. They are made either right or left hand, as may be desired. Cut represents right hand machine.

No. 1 Trimmer cuts from 10 to 16 feet boards, as shown in cut, ready to attach power.

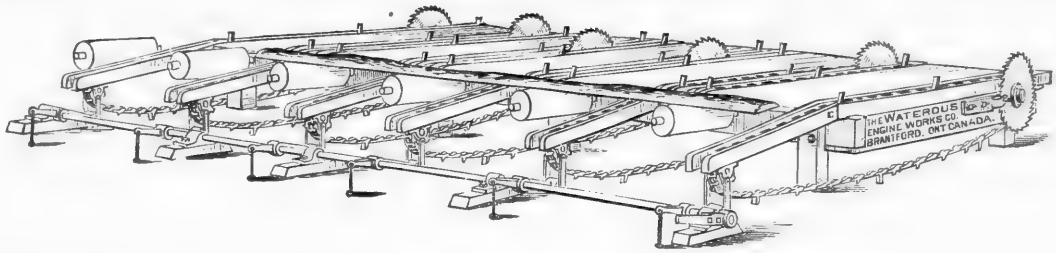
"	2	"	"	10 to 18	"	being	6	saws	"
"	3	"	"	10 to 20	"	"	7	"	"
"	4	"	"	10 to 22	"	"	8	"	"
"	5	"	"	10 to 24	"	"	9	"	"



Improved Gang Slab Slasher,

- - - USING EWART CHAIN BELT. - - -

THE above cut represents our six saw machine. We make these however with any number of saws required, with wide or narrow table, and with top of table either inclined or level to suit the varying conditions in different mills. The Feed Gear is so arranged that the carrying chains may be stopped and started at the will of the operator. These chains run in guides same as in our Trimmer, and are provided with sharp spurs (R 2 Special), which aid in holding the slabs securely, while the Lug (or H) carry them to the saws. Our Slashers, when so ordered, are fitted with our *Improved Saw Collars*, which allow the Saws to accommodate themselves to the side pressure caused by a wedging slab, thus avoiding breakage of saws. This feature, we think, will commend itself to all millmen. We shall be pleased to furnish plans and estimates for Slashers of any description. Prices according to number of saws, length, capacity, etc.



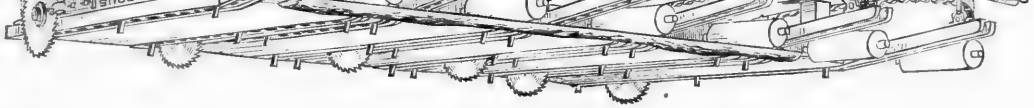
Improved Six-Saw Slat Slasher

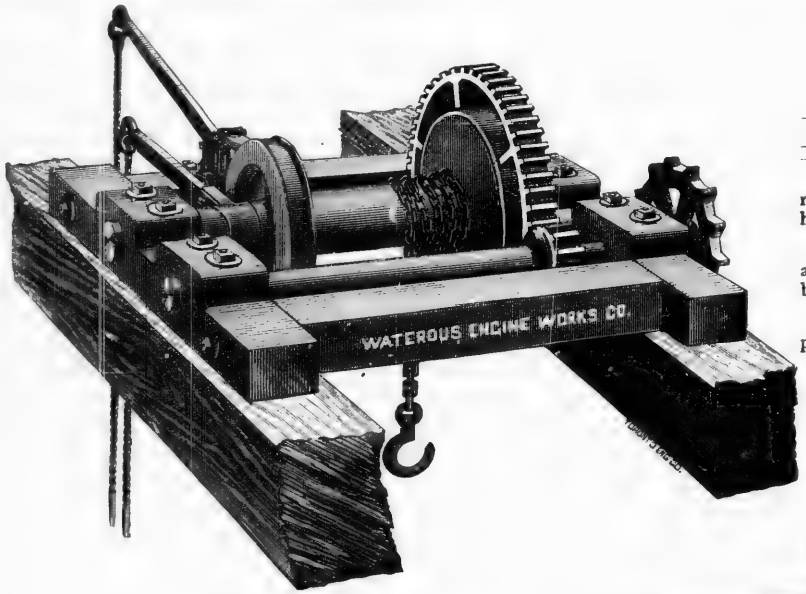
THE above cut represents our six-saw 20-ft. Slasher complete, with addition of tilting rails and rolls, which are often called for. We make these, however, with any number of saws required, with wide or narrow table, and with top of table either inclined or level, to suit the varying conditions in different mills. The Feed Geer is so arranged that the carrying chains may be stopped and started at the will of the operator. These chains run in guides, same as in our Trimmer, and are provided with sharp spurs which aid in holding the slabs securely, while the Lug (or H) links carry them by the saws. All our Slashers are fitted with our PATENT SAW COLLARS, which allow the saws to accommodate themselves to the side pressure caused by a wedging slab, thus avoiding breakage of saws This feature we think will commend itself to all millmen. We shall be pleased to furnish plans and estimates for Slashers of any description.

ROLLS AND TRANSFER

Section of Live Rolls and Transfer for handling Lumber in Saw Mills and Wood-Working Establishments using Link Belt.

We furnish live and dead rolls of all sizes and descriptions. Cast iron, wrought iron, or wood. The latter are made when possible of a special unsplitable wood, with a rough iron bar, usually $1\frac{3}{4}$ in. dia. driven clean through roller. The roller and shaft are then turned together. To drive these rolls we use Ewart Patent Drive Chain, as shown in cut. The best medium extant for carrying and elevating all the material into, through, and out of a saw mill. Send for special Link Belt Circular.



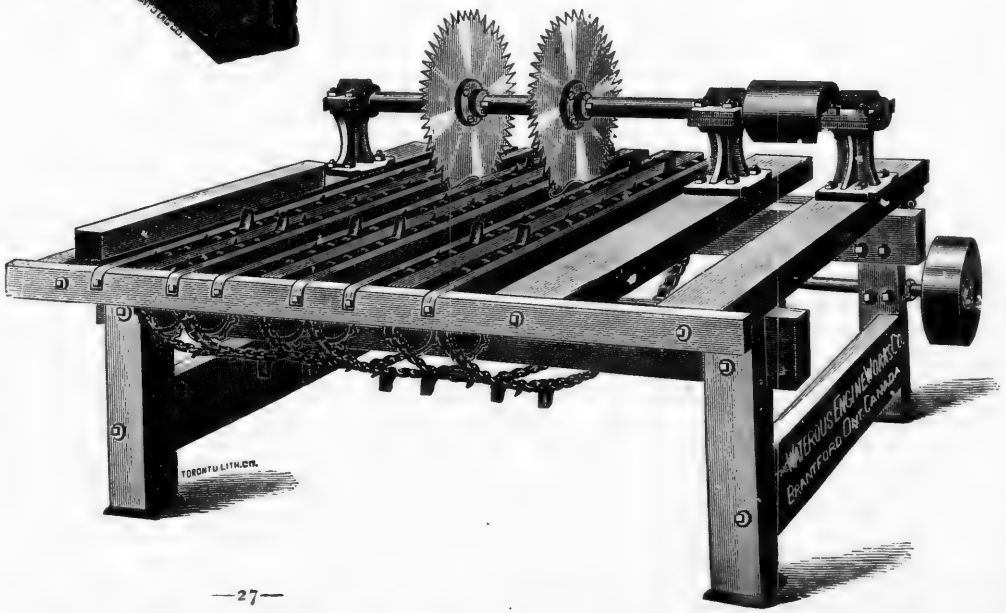


Log Turner or Canter

WE build several styles of Log-turner or Canters. The one represented is for placing over carriage—turning log with chain or rope and hook. It has the advantage of being able to turn a log either way.

The ordinary "Nigger" Canter is worked from under the floor and consists of a heavy wooden bar spiked, which works up through the floor and turns the log but only one way.

This is often made with a simple device at the lower end for dropping the point back to catch a log on the skid ways and bring it forward on to the log seats

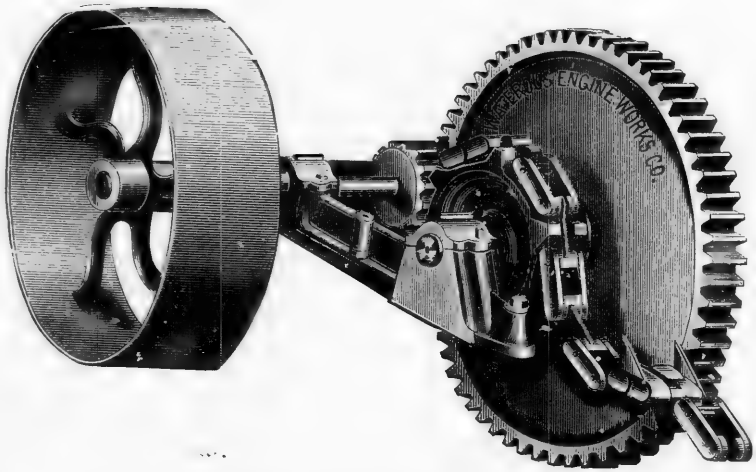


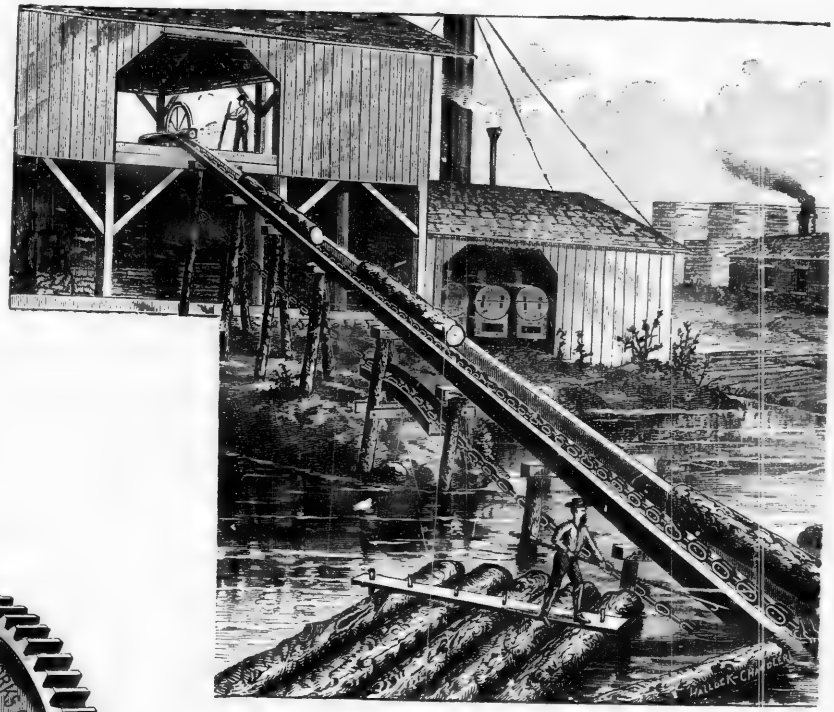
Two-Saw Overhead Slab Slasher

WHEN a cheaper class of slasher is required we furnish the above 2-saw slasher, which is sufficiently plain in cut to not require a further explanation.

Our Iron Frame Log Jack

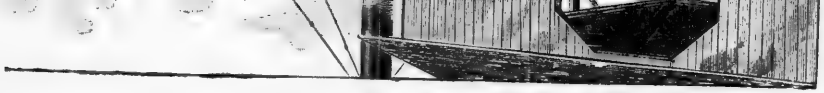
shown in cut below, has a strong heavy frame, well-proportioned for the work to be done. The driving pulley, which is plain or double flanged, is 36 inches in diameter, 13 in. in face. The pinion is double flanged, has a 2-inch pitch, 5½-inch face, and 14 teeth. The Gear Wheel has a solid plate centre, and is 44 inches in diameter, with 69 teeth, 2-inch pitch, 5-inch face. The Chain or Sprocket Wheel, as ordinarily made is 20 inches, and will be made to fit any chain required. We have a large number of these Jackers at work in connection with our Giant Chain, formerly a continuous Log Haul, which can be hardly excelled.



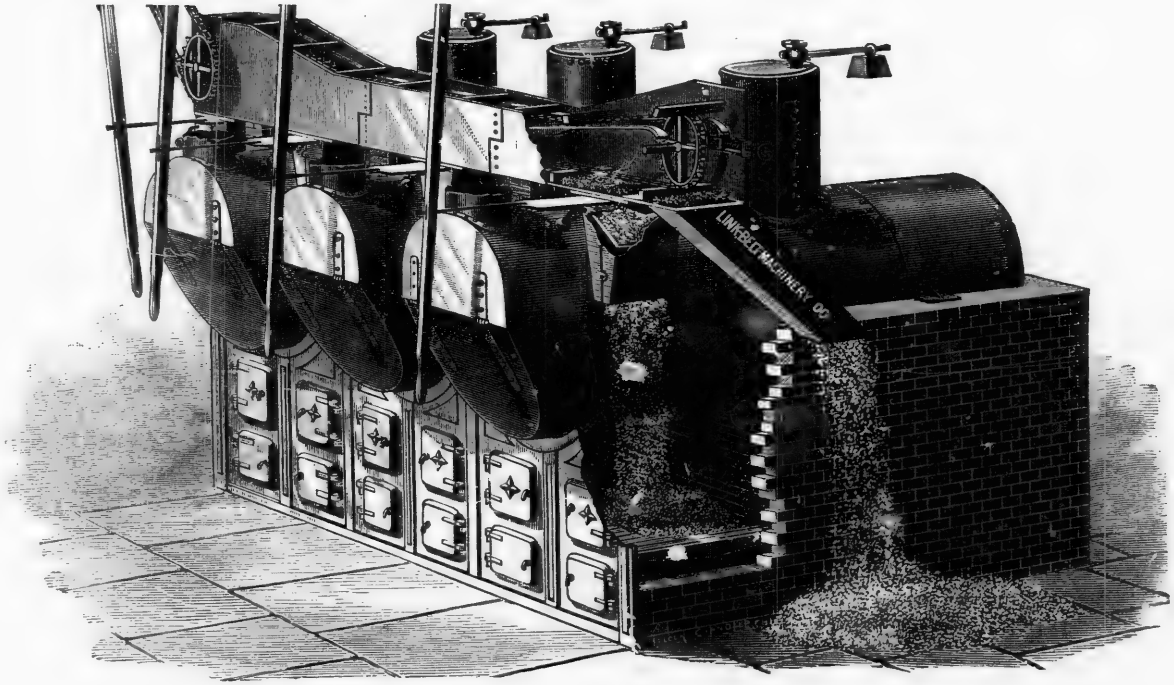


Log Haul Up

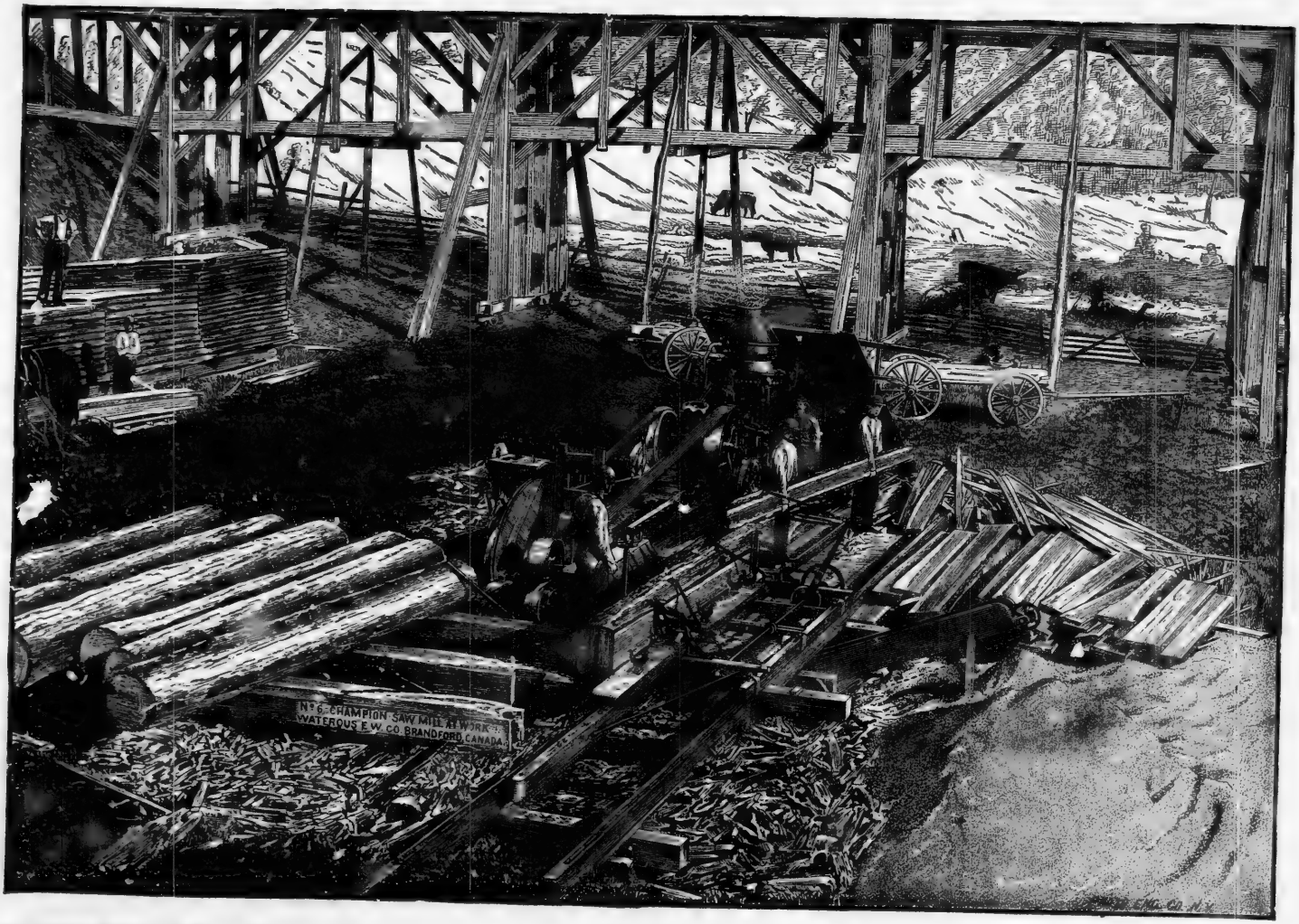
SHOWING Giant Chain in use. This Chain is best returned by having the tooth specials ride on the edge of a scantling or plank running between the teeth in place of device shown in cut.



AUTOMATIC FUEL FEEDERS,
for Boiler Furnaces.



Can be made for any number of Boilers and of any Capacity. Prices given on application.



PORTABLE MILLS of all capacities and with all styles of Engines and Boilers. They are specially adapted to railroad and bridge building, or setting up in new districts, or cutting scattered timber in the older districts long since lumbered over. Many of these mills were used in building Canada's great transcontinental road, the "C.P.R."

Ground Plan of Fifty Horse-Power Semi-Portable Saw Mill

BUILT FOR MR. E. BUSE, OF VANCOUVER, BRITISH COLUMBIA.

After above plan was made the Mill was changed by the addition of a large Double Edger.

- DESCRIPTION -

Fifty horse-power return tubular fire-box boiler on wheels, with sixty feet of stack, connected to a 12 x 14 engine, speeded 300 revolutions per minute.

Pulleys on engine shaft 60 x 18 to main saw, 30 x 6 to bull wheel counter, 30 x 8 to slab saw counter.

Pulley on saw mandrel 30 x 18, which runs the 56-inch Hoe chisel tooth saw 600 revolutions per minute.

Bull wheel counter has 24 x 8 pulley and an 8 x 12 friction pinion working on 48 x 10 friction wheel.

Slab saw counter has a 24 x 8 pulley running 480 revolutions, and 30 x 10 mitre frictions connecting to ladder shaft.

Pulley to mandrel 18 x 8 and on mandrel 8 x 10, driving 40-inch saw 1,000 revolutions.

The carriage is our medium size with three double steel girder blocks opening up forty inches from the saw, fitted with peel dogs and driven by rope feed.

The seven rollers 24 x 10 placed between the saw frame and slab saw facilitate greatly the handling of timber and lumber.

We give this as one of the various styles of heavy portable mills that we build. It can be arranged to suit any location, or for an elevated mill when desired.

ROCKY MOUNTAINS IN THE DISTANCE

From a Photograph of the McDermid & Ross Mill, at Duggans Siding, B. C.

:: Interesting Letter from British Columbia ::

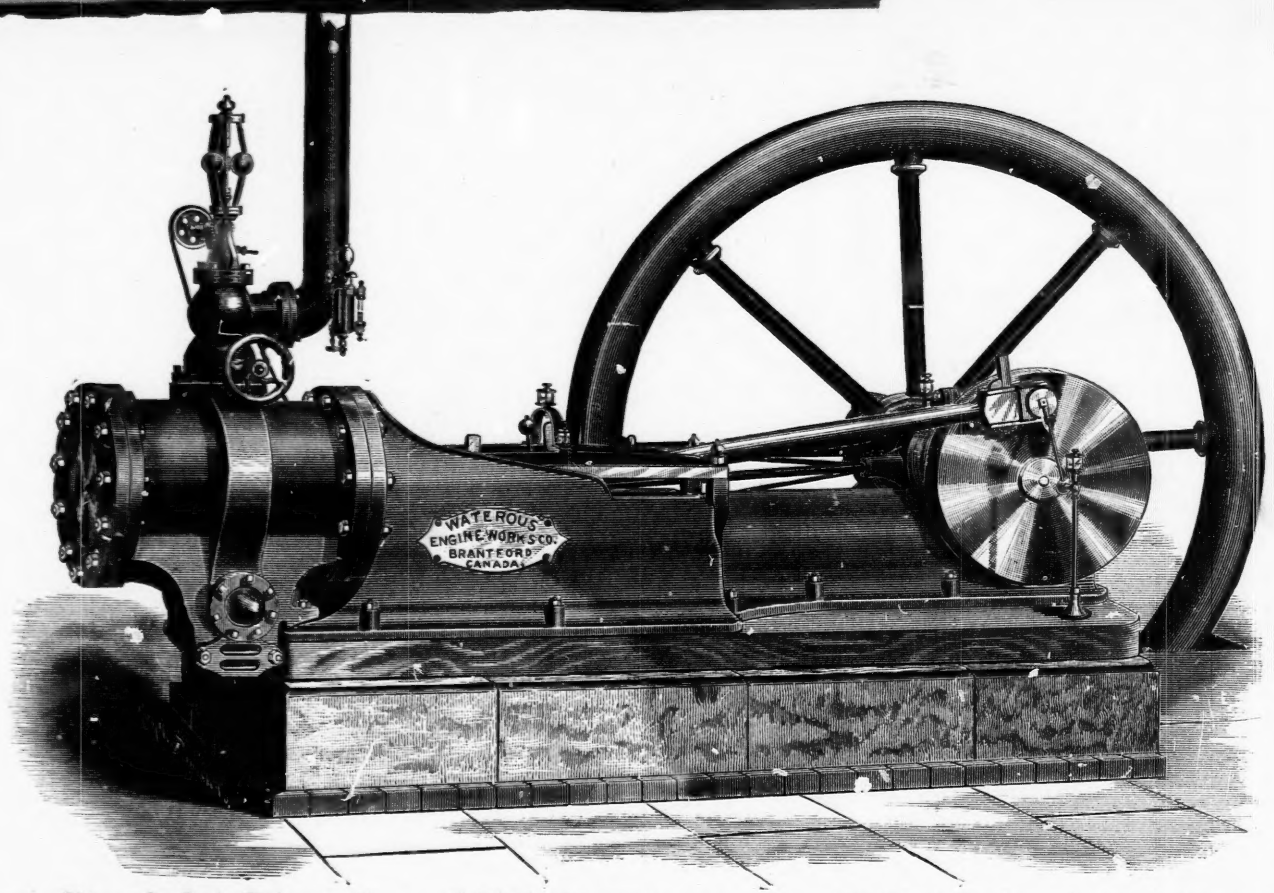
LETTER FROM JOHN LYLE,

ROSS SAW MILL, Duggan's Siding, B. C.

As I have now finished here cutting with the mill, I thought you would be pleased to know how it worked and what amount this mill is able to cut when run with proper care. As it is the first of this particular style of mill you have sent to the Rockies, and as I have kept account of all expenses of running this mill and the amount it cut, I am able to give you a correct statement of what it cost to handle lumber in this part. Any of your customers may rely on the truth of my statements. As you are aware, I left Brantford on the 20th May, the mill being shipped at the same time. I arrived at the Rockies on the 8th of June by way of the Canadian Pacific Railway. The mill arrived on the 12th, and on the 21st we started to saw, and by the 8th of November we had cut 3,500,800 feet. The last month's cutting was the largest, amounting to 817,000 feet. These are the figures of the measurer employed by the C. P. R., and are correct, making an average of 31,423 feet per day of not more than 13 running hours per day. This was all cut into inch boards and 3 and 4 inch planks, and all sizes to 8, 10, 13 and 14 wide. All the cutting and edging had to be done with the large saw, as we had no edger. The timber was spruce, pine, fir, cedar and hemlock. I see in some of your circulars that you give the amount of what has been cut per hour and per day, but I thought it would be more satisfactory to you and to your customers to know what such a mill could do in the season and you may rely upon this statement as being absolutely correct during this time. The expenses for repairs only amounted to $1.50, viz.: for 1 bolt in friction lever, 1 bolt in saw lever, and repairs in timber gauge. This mill was never stopped one working hour during the whole season. The new dogs are a complete success, they are quick, and sure to hold every time. I am satisfied that there need be no trouble or delay in running these mills if they are properly looked after. There was no extra chance to make this mill run any better than any other. The men were all picked up as they came along. The only man that had any experience in a mill was the sawyer. I filed the saws myself, and kept all other things right. It might be interesting for you to know how much timber it takes to built one of these snow-slide sheds per mile. It takes over 6,461,800 ft. of timber, and 62,080 bolts 36 in. long, and 200,000 spikes 10 in. long. I do not refer above to the ordinary snow sheds such as used on the Intercolonial Railway. These are used here also where snow is likely to drift in, but in speaking above I refer to what might more properly be called snow slides. They are built at a point where snow slides are apt to occur always in the face of steep and high mountains. One side (the high side of shed) is built up into the side of the mountain and has a slant over the track something like a shed roof. They are wonderfully strong, and you may be sure are none too much so, as the accumulated snow of many years may start from the top of these lofty hills and come thundering down in masses 50 to 100 or 200 feet thick, with a force that nothing can resist unless it is the mountain on the other side of the valley from which the slide takes place. The snow in passing down, slides over the top of the snow slide and passes on down into the valley and on up, may be several hundred feet up, the side of the mountain opposite. One can imagine what would be the result of such a slide striking a passenger train. Certainly nothing but pieces of the smashed up wreck, that would be unrecognizable, would ever be found. Near where I am one of these slides happened. The snow came down the mountain in a body estimated to be 175 feet thick. It struck the track and carried it bodily down the mountain to the valley, across the river that flowed through the valley, and up the opposite side to about the same height. It was there the railway track was found after the snow melted, and where it was stuck. Some cars were wrecked at the same time, and were never found, probably the remains were carried down by the melting snow to the Columbia River, and then out to the Pacific.

The location here is a very beautiful one. A photographer who is out among the mountains taking views for the Canadian Pacific, came along one day and took a picture of the mill, and I send you one, which will give a fair idea of what the place looks like.

[Then follows most interesting description of the locality, for which we have no space here, but the letter will be sent to any one desiring it.]



Heavy Straight Line Saw Mill Engines

MANY of the above design of Engines have been furnished lumbermen during the last few years. The frame is exceedingly well proportioned, giving great strength exactly where needed. This has been demonstrated by the great satisfaction it has given all its numerous purchasers.

We manufacture Automatic Engines, four valve moderate speed, and single valve high speed, of new and improved designs, guaranteed as to economy and perfect motion.

BOILER, TANK AND BURNER WORK.—We have a large and well equipped boiler shop, capable of turning out the heaviest work on short notice. We shall be glad to give estimates for any description of work in this line.

We also manufacture largely Woodworking Machinery, Veneer Machines, and Farm Engines, for each of which we have a special circular. If interested, send for one.